

## PROFILE FOR ASSISTING IN THE CONSTRUCTION OF A FLOOR OF A POOL

### RELATED APPLICATIONS

The present application is based on, and claims priority from, France Application Number 04 01634 filed February 18, 2004, France Application Number 04 03622 filed April 6, 2004 and PCT/FR2005/000351 filed February 16, 2005, the disclosures of which are hereby incorporated by reference herein in their entirety.

### FIELD OF THE INVENTION

The present invention relates to a profile ~~designed for assisting in the construction~~ of a floor for a pool, ~~which is capable of floating or being immersed, the profile being provided with~~ including at least one internal cavity crossing it longitudinally and which is intended to be used as ballast, the profile presenting a first end and a second end sealed respectively by a first end piece and a second end piece provided with connection means through which the profile can be filled or emptied.

### BACKGROUND OF THE INVENTION

Such a floor, commonly known as a floating floor, is intended to cover the surface of the water contained in a swimming pool, in periods of non-use, chiefly in order to prevent risks of drowning and reduce the heat loss of the water with respect to the exterior and which can be immersed to enable the normal use of said swimming pool.

Such a floor is constituted by, for example, hollow profiles manufactured from plastic and joined laterally and which are filled with water to immerse it or filled with air to cause it to rise. The ends of a single side of the profiles are connected to each other by means of a manifold that is itself connected to a first pipe linked to a pump of the suction/pressure type of a water filtering unit of the swimming pool. This pump is connected to a second pipe, the free end of which is immersed in the water of the swimming pool.



The ends of the profiles located on the opposite side are connected to each other by means of another manifold that is itself connected to a third pipe, the free end of which is located above the level of the water.

To immerse the floor at the surface of the water, the pump is switched on in a first position called suction in which it sucks up the water contained in the swimming pool and forces it into the profiles, which then fill up. The water gradually fills the profiles during this operation.

It may happen that during this operation, the water introduced into the profiles, seeking to occupy a volume located at the lowest point, moves to the same side of the profiles, with the result that one end of the profiles sinks first whereas the other end rises in reaction and comes out of the water, which causes the floor to tip up. This situation can prove to be delicate as the emerged end of the floor generally slides on an edge of the swimming pool and the floor does not lower correctly.

#### SUMMARY OF THE INVENTION

Hence, the aim of this invention is therefore to propose in particular a profile for a floating floor of a pool such as a swimming pool, the profile being designed so that the floating floor can move in parallel to the surface of the liquid during the immersion and emersion operation of the said floor.

To this effect, a profile is proposed that is designed for the construction of a floor for a pool, and that can float or be immersed, the profile being provided with at least one internal cavity crossing it longitudinally and which is intended to be used as ballast, the profile presenting a first end and a second end sealed respectively by a first end piece and a second end piece provided with connection means through which the internal cavity can be filled or emptied, the said profile being noteworthy in that the connection means are connected respectively to two channels opening out, for the one, into the upper section of the internal cavity and, for the other, into the lower section of the internal cavity.



The water allowed into the profile enters the profile from its lower section and the expelled air leaves by its upper section, with the result that it can be almost completely filled with water before another profile connected further on can begin to be filled.

Conversely, when emptying the profile, the water is evacuated through its lower section, with the result that it can be emptied almost completely of its water as soon as the other profile is emptied and that it only lets air enter the said profile.

A floating floor constructed with such profiles thus moves while maintaining a horizontal level during its immersion or emersion movement in the pool.

According to an additional characteristic of the invention, and in a first embodiment variant, the profile comprises internally an upper conduit and a lower conduit arranged on either side of the internal cavity, which are connected respectively to the said internal cavity by passages, the channels being connected respectively to the upper and lower conduits.

The profile is also fully filled and emptied, even in the case in which it is placed in an inclined position, as for example when it is lying on an inclined pool floor.

Advantageously, a first and a second separating wall delimit the two upper and lower conduits and the internal cavity, one end of the first wall covering one edge of a base of the first end piece, another end of the first wall being arranged offset from the edge of a base of the second end piece to create one of the passages, the second separating wall being offset in the reverse direction of the first.

Such a profile is realized simply by shortening the separating walls.

According to one additional characteristic of the invention, the profile comprises an articulated link enabling it to be assembled in an articulated manner with another profile arranged laterally for, for example, to follow a change of slope in the floor of the pool.

Advantageously, the articulated link is constituted by a tongue and a groove arranged respectively on the lateral sides of each profile.



According to an additional characteristic of the invention, the profile comprises rims on either side of its lower wall, forming a stop to limit the angular motion when closed with another profile arranged laterally.

According to an additional characteristic of the invention, the groove and the rims are realized discontinuously on each profile to create a plurality of places of water passage, to be able to accelerate the immersion and emersion movements of the floating floor.

This may be a straight type connector to connect the profile with another profile located in its extension or a connector of the elbow type to connect the profile with another profile located laterally. Each connector is preferably fixed by gluing in a housing opening in the front wall of each end piece.

According to an additional characteristic of the invention, the profile is provided with an articulated junction capable of assembling two profiles arranged in line with each other from a mechanical point of view and in an articulated manner.

Advantageously, the articulated junction comprises a first sleeve and a second sleeve mounted respectively on shaped supports protruding from the end pieces.

According to an additional characteristic of the invention, the first and second sleeves are constituted by a section of a profile cut in two parts along its median plane, the sleeves being coupled by the articulated link and their lateral walls being drilled with holes to allow for the passage of a connecting pipe between the connection means.

According to an additional characteristic of the invention, an inclination device is fitted between the first and second sleeves to increase, according to a particular value, the angle of opening of two profiles arranged in line with each other.

According to an additional characteristic of the invention in a second embodiment variant, the profile comprises a plurality of internal cavities arranged side by side and such that each specific end piece that seals each of its ends is provided with connection means opening respectively into the internal cavities.

The largest width of this profile allows the floating floor to be fitted more rapidly.



According to a an additional characteristic of the invention, the profile is provided, in a third embodiment variant, with a third conduit arranged between the upper conduit and an upper wall of the profile, the third conduit being provided to enable water to circulate to heat it under the effect of solar radiation, each end piece being provided with an additional connection connecting with a channel opening out into the third conduit.

Advantageously, one of the end pieces of this profile is provided with a wall delimiting one side of the channel and that is extended by an edge penetrating the third conduit.

According to an additional characteristic of the invention, the connection means through which the profile can be filled or emptied or the additional connection is via an offset connector.

A floor for a pool, capable of floating or being immersed, the floor comprising profiles as described above is also covered by the present invention.

According to a characteristic of this floor, it is constituted by several groups of rows of profiles and for a single group, the rows are connected one after the other so as to give priority to a filling of the rows located closest to the edge of the floating floor.

According to an additional characteristic of the invention, the floor is provided with a protective belt bordering its edge, the protective belts incorporating a flexible pipe.

According to an additional characteristic of the invention, the groups are connected, on the one hand, to a filling an emptying manifold designed to be connected to a pump of the suction/pressure type and, on the other, to a vent manifold.

According to an additional characteristic of the invention, a manifold for feeding and purging a water heating circuit is connected in parallel to the filling and draining manifold.

According to an additional characteristic of the invention, another vent manifold is connected in parallel to the vent manifold to separate the water heating circuit of the floating floor from its ballast circuit.



## BRIEF DESCRIPTION OF THE DRAWING

The characteristics of the aforementioned invention will emerge more clearly upon reading the following description made with reference to the drawings attached in the appendix, wherein:

Fig. 1 shows a partial top view of a swimming pool covered with a floating floor being immersed according to the invention,

Fig. 1bis shows a top view of a swimming pool covered with a floating pool according to the invention,

Fig. 2a shows a front view of two profiles assembled laterally to each other and designed for the manufacture of a floating floor according to the invention,

Fig. 2b shows a view of two profiles in a position of assembly or disassembly according to the invention,

Fig. 2c shows a view of two profiles assembled laterally to each other in an extreme position of operation according to the invention,

Fig. 2d shows a front view of a first embodiment variant of two profiles assembled laterally to each other according to the invention,

Fig. 3 shows a perspective view of two profiles assembled laterally to each other by an articulation according to the invention,

Fig. 4a shows a cross-section view of a profile provided at its ends with connecting end pieces according to the invention,

Fig. 4b shows a cross-section view of a profile according to the invention,

Fig. 4c shows a cross-section view of a profile of a first embodiment variant and provided at its ends with connecting end pieces according to the invention,

Fig. 4d shows a cross-section view of a profile of a first embodiment variant according to the invention,

Fig. 4e shows a cross-section view of a profile of a first embodiment variant and provided at its ends with connecting end pieces fitted upside down according to the invention,



Figs. 5a and 5b show perspective views at different angles of an end piece designed to be fitted at each end of a profile according to the invention,

Fig. 5c shows a perspective view of an end piece provided with a straight type of connector according to the invention,

Fig. 5d shows a perspective view of an end piece provided with an elbow type connector according to the invention,

Fig. 6 shows a diagrammatic view of a floating floor and its hydraulic connection system according to the invention,

Fig. 7 shows a partial cross-section view of two profiles joined at their ends by an articulated junction according to the invention,

Fig. 7bis shows a partial cross-section view of two profiles joined at their ends by an articulated junction in a position for assembling a connecting pipe according to the invention,

Fig. 8 shows a partial cross-section view of two profiles joined at their ends by an embodiment variant of an articulated junction according to the invention,

Fig. 9 shows a perspective view of two profiles arranged in parallel with each other and whose connection ends are protected by a protective casing according to the invention,

Fig. 10 shows a cross-section view of a first embodiment variant of a profile according to the invention,

Figs. 11a, 11b and 11c show views illustrating the hydraulic operation of a floating floor according to the invention,

Fig. 12a shows a cross-section view of a swimming pool provided with a floating floor in emerged position according to the invention,

Fig. 12b shows a cross-section view of a swimming pool provided with a floating floor in immersed position according to the invention,

Fig. 13 shows a perspective view of a second embodiment variant of a profile and a specific corresponding end piece according to the invention,



Fig. 14 shows a front view of two profiles assembled laterally to each other according to a third embodiment variant according to the invention,

Fig. 15 shows a perspective view of a specific end piece adapted to a profile of a third embodiment variant according to the invention,

Fig. 16 shows a perspective view of another specific end piece adapted to a profile of a third embodiment variant according to the invention,

Fig. 17a shows a cross-section view of a profile of a third embodiment variant according to the invention,

Fig. 17b shows a cross-section view of a profile of a third embodiment variant and provided with specific corresponding end pieces according to the invention,

Fig. 18 shows a view of a floating floor comprising profiles of a third embodiment variant and its hydraulic connection system according to the invention, and

Figs. 19a and 19b show views illustrating the hydraulic operation of a floating floor incorporating profiles of a third embodiment variation according to the invention.

#### DETAILED DESCRIPTION OF THE DRAWING

The floating floor that is described in this invention is designed to be able to float on the surface of a liquid contained in a pool such as a swimming pool to prevent humans or animals from drowning or to support any objects that may fall into the said pool. The floating floor of the invention can also be immersed so as to lay on the bottom of the pool to allow normal use.

In the following description of the floating floor of the invention, only the application as a swimming pool cover is described.

The floating floor 100 covering a swimming pool shown in Fig. 1, for which only the ends are shown in this fig., is constituted by an assembly of profiles 200, 200' that are connected to a filling and draining manifold 400 and to a vent manifold 500. The arrows shown on the profiles 200, 200' symbolize the direction of circulation of the water in these profiles when the floor is being immersed.



In fig. 2a, each profile 200 comprises an internal cavity 202 crossing it longitudinally and which is designed to be used as ballast to make it heavier or lighter than the water in order either to sink it to the bottom of the swimming pool, or float it on the surface of the water contained in the said swimming pool.

Each profile 200 preferably has a rectangular cross-section. It will preferably be manufactured in a plastic material by an extrusion process. Its density is greater than that of water, that is its density is greater than one.

Each profile 200 comprises an articulated link 210 enabling it to be assembled in an articulated manner with another profile arranged laterally.

The articulated link 210 is constituted advantageously by a tongue 212 and a groove 214 arranged respectively on the lateral sides of each profile 200 and near its upper wall 204, namely the wall that is normally intended to face upwards and which are formed so as to cooperate one with each other to mutually assemble two profiles 200 in an articulated manner when they are arranged one against the other on one of their sides, as shown in fig. 2a.

The opening provided on the groove 214 enables the two profiles 200 to be assembled when they are tilted laterally with respect to each other at an angle of approximately  $60^\circ$ , as the arrow F1 shows in fig. 2b.

The angular motion of the two profiles 200 assembled to each other can oscillate in a range of angles between  $00^\circ$  and  $30^\circ$ , as shown in fig. 2c so that the floor, constructed with such profiles, can adapt to the geometry of the swimming pool bottom without becoming dislocated. In fig. 2a, rims 230 forming a stop to limit the angular motion of the two profiles 200 when closed are provided on both sides of the lower wall 206 of each profile 200, and extending from it.

In fig. 3, the groove 214 and the rims 230 are realized in a discontinuous manner on each profile 200, thus creating a plurality of sites for the water to pass, so as to accelerate the immersion and emersion movements of the floor and thus prevent the swimming pool water from being mixed too violently at the edge of the said floor.



In fig. 4a, the profile 200 shown is closed at each end by an end piece 250 enabling the profile 200 to be connected with another profile arranged in line with or laterally to it or even with a manifold. The filling or emptying of the profile 200 is thus performed through the end pieces 250. The end piece 250 can be manufactured, for example, by injection or extrusion followed by a machining phase.

The end piece 250 shown in figs. 5a and 5b comprises a flange 252 forming a stop and outer perimeter similar to that of a profile and which is provided on one side by a band 260 and, on the other, two supports 280 arranged along the long sides of the flange 252. The band 260 is adapted to be inserted and fixed, for example by gluing, at one end of a profile 200, as shown in fig. 4a. In figs. 5a and 5b, the band 260 is provided with studs 262 surrounding a base 274 featuring on the end piece 250 and which can be fitted at one end of the profile.

In figs. 5a and 5b, a connection means 270 is realized through the front wall of the end piece 250, namely, in the wall opposite the base 274 and that is designed to face outward from the profile.

The connection means 270 is constituted, for example as shown in fig. 5c, by a straight male connector for connecting two profiles arranged in line with each other or by a male elbow connector as shown in fig. 5d, for connecting a first profile to a second profile arranged laterally to it, either directly by being placed beside it, or by being placed further away. Each of these connectors is assembled in a housing 271 opening into the front wall of the end piece 250 by being fixed preferably by gluing.

In fig. 4a, the connection means 270 of each end piece 250 is connected to a channel 272 that opens out laterally into the end piece 250 through the band 260. The end pieces 250 are positioned by being offset at an angle of 180° with the result that the channel 272 of an end piece 250 opens out opposite the internal face of the upper wall 204 of the profile 200 (on the left of fig. 4a), whereas the channel 272 of the other end piece 250 opens out opposite the internal face of the lower wall 206 of the profile 200 (on the right of fig. 4a). In other words, the channel 272 of an end piece 250 opens out into the upper section of the internal cavity 202 and the channel of the other end piece 250 opens out into the internal cavity 202.



Hence, when the profile 200 is being filled, water enters the profile from the lower section and the expelled air leaves by the upper section, with the result that it can be almost completely filled with water before another profile connected further along can begin to be filled.

Conversely, when emptying the profile 200, the water is sucked out through the lower part, with the result that it can be emptied almost completely of its water as soon as the other profile is emptied and that it only lets air into the said profile.

In fig. 4c, the profile 200' shown is a first embodiment variant of the profile 200 described above. The profile 200' is designed to be used in the structure of the floating floor by being positioned in this floor to rest on a sloping floor of a swimming pool. Indeed, such profiles thus positioned are more complicated to empty, to the extent that when they tilt on contact with the sloping floor during their immersion, they can no longer be emptied completely owing to the fact that the outlet of the channels in the profile is located below the culminating point of the inside volume of the profiles, which has the consequence of imprisoning a volume of air in the upper section of the interior volume of each of these profiles which remain floating or tilt the floating floor.

This remark is also valid for the profiles that are among the last to be filled that still remain floating whilst the floating floor is resting at the bottom.

On filling, the expulsion point in the profile 200' is thus positioned at the highest point, with the result that it can be almost completely filled.

On emptying, the suction point in the profile 200' is positioned at the lowest point, with the result that it can be almost completely emptied.

In fig. 2d, each profile 200 is provided with two interior filling and/or emptying conduits 220, 222 surrounding the internal cavity 202 and which are arranged against the upper wall 204 or the lower wall 206 of the said profile 200'. Conventionally, the conduit 220 situated under the upper wall 204 of each profile 200', namely the one that is designed to face upwards during the operation of the floating floor, is called the upper conduit. The other conduit 222 is called the lower conduit. Two separating walls 224 and



226 thus delimit the two conduits 220, 222 and the internal cavity 202 in each profile 200'.

In figs. 4c, 5a and 5b, the studs 262 of the end piece 250 comprise longitudinal slots 264 designed to mount the separating walls 224 and 226 of the profile 200', as shown in fig. 4c. The two supports 280 also feature respectively two slots 284 that enable junction accessories to be mounted with other profiles, described at a later stage.

In fig. 4c, the channel 272 that is connected to the connection means 270 opens out laterally into the band 260 in such a manner that it can be connected, according to the end piece 250 to which it belongs, to the upper conduit 220 (end piece 250 on the left of fig. 4c) or to the lower conduit 222 (end piece 250 on the right of fig. 4c) of the profile 200'. Thus enabling the connection means 270 to be connected with either the upper conduit 220 or the lower conduit 222. In this Fig. 4c, the connection means 270 of the end piece 250 located on the upper right-hand of fig. 4c is connected to the lower conduit 222.

It will be noted in figs. 4c and 4d that the edges of the separating walls 224, 226 are offset in relation to the end of the profile 200' according to two possible distances L1 or L2. The offsets are realized advantageously by a cutting operation using a hollow punch or by a milling operation.

When the withdrawal is the shortest (distance L1), the separating wall 224, 226 can cover an edge of the base 274, as shown in the bottom right-hand area of fig. 4c so as to separate the internal cavity 202 from the corresponding lower conduit 222.

When the offset is the longest (distance L2), the separating wall 224, 226 does not cover the said edge of the base 274, as shown in the top right-hand area of fig. 4c so as to connect, by a passage 228 thus created, the internal cavity 202 with the corresponding upper conduit 220.

The same separating wall 224, 226 has a short offset (distance L1) and a long offset (distance L2) according to one or other of the relevant ends of the profile 200'. At the same end of the profile 200', the values of the offsets (L1, L2) of the separating walls 224 and 226 are different.



It will be noted in this fig. 4c that the positioning of each end piece 250 in the profile 200' is carried out in such a manner that the channel 272 can open out onto a conduit 220, 222 for which the offset from the separating wall 224, 226. is the shortest, as shown in the top right-hand area of fig. 4c and in the bottom right-hand area of this same fig. 4c.

The end piece 250 through which the water is admitted into the profile 200' is shaped so that its channel 272 can open directly into the lower conduit 222, which also corresponds to the position of the end piece 250 located on the right of fig. 4a.

If the floating floor is required to cover a sloping floor in its immersed position, it will be ensured that the different profiles entering into its constitution are assembled by placing their passages 228 so that they are situated in the highest part of the said profiles when they are lying on the floor of the swimming pool.

During its emptying operation, the air entering the profile 200' enters the profile by the upper section and the expelled water leaves by the lower section, with the result that it can be almost entirely emptied before another profile connected further up can be emptied in its turn and even though the profile can be positioned in a non-horizontal manner.

The filling of the different rows of profiles used in the construction of a floating floor can therefore be controlled in this manner. To illustrate this purpose, fig. 6 diagrammatically shows a floating floor 100 constituted here by 4 groups 01- 04 that are each constituted by 4 rows each comprising two profiles connected together in line with each other. For the immersion or emersion operations of the floating floor, the groups 01- 04 are filled or emptied at the same time. Each group G1-04 is connected on the one hand to a filling and draining manifold 400 that is itself connected to a pump P of the suction/pressure type and, on the other, to a vent manifold 500. The connection of the rows in the same group is obtained in such a manner that the rows closest to the edge of the floating floor can be filled first and emptied last to force the floating floor to sink at the edges so that it can be immersed correctly without being held back. For this purpose, the filling and draining circuit of each group describes, in this fig. 6, two Us nested in each other as shown by the arrows I to 10 symbolizing the filling order of group 02 by the



pump P. In fig 1, the arrows present on the profiles 200, 200' specify for each group G1-G4 the filling order of the different rows of profiles and thus show that those that are located the closest to the same lateral edge of the swimming pool are filled first.

It will be noted that a row can be constituted by one or more profiles according to the dimensions of the swimming pool to be covered or the standard length of each profile. In fig. 1bis, five profiles constitute each of the rows involved in constituting the groups 01 to 04.

The ends of the profile 200' shown in fig. 4e are provided with end pieces 250 that are fitted upside down with respect to their direction of assembly shown in fig. 4c. This arrangement of end pieces 250 enables the connection means 270 to open out, through the channels 272, into the internal cavity 202. For economic reasons, it is thus possible to provide a single type of profile of type 200' that can be used to replace the profile 200 by offering the same functions as the latter profile.

In fig. 7, an articulated junction 300 is implemented to assemble, from a mechanical viewpoint and in an articulated manner, two profiles such as those described above and which are arranged in line with each other. It is thus possible to design a floating floor that can cover a swimming pool floor composed of several secant planes.

The articulated junction 300 comprises a first sleeve 310 and a second sleeve 320 assembled respectively on the two pairs of supports 280 of the flanges of the two end pieces 250 sealing the facing ends of the two profiles. The sleeves 310 or 320 are each advantageously constituted by a section of a profile 200, 200' that has been cut into two sections along its median plane and by placing the two parts back-to-back. Their lateral walls are drilled with holes for the passage of a pipe 340.

Each sleeve 310 or 320 is fitted then assembled preferably by gluing on the two stubs 280 and possibly in the slots that they contain.

The cut length of the profile section is identical to its width so that the outer perimeter of the sleeves 310 and 320 is identical to that of a profile so as not to create any discontinuity of form in the junction area.



The articulation joining the two sleeves 310 and 320 of the articulated junction 300 is advantageously realized by a tongue 212 and its corresponding groove 214 coming from the section cut from a profile so as to allow an angular movement between two consecutive profiles at the level of their ends so that the floating floor can adapt to a swimming pool floor with multiple slopes. The angular motion of the two profiles is limited in one direction by the rims 230 present respectively on the first sleeve 310 and the second sleeve 320. When the rims 230 are in contact, the two profiles are arranged noticeably in alignment with each other.

The pipe 340, preferably a flexible pipe of the annular type, is mounted by its ends on the connections 270 of the two end pieces 250 to connect the two profiles from a hydraulic point of view.

The mounting of the tube 340 on the connectors 270 can be helped by bending the two profiles along their shared axis of articulation as shown by the arrow F2 in fig. 7bis illustrating the movement of rotation of a profile with respect to another profile that is joined to it.

To increase the angular motion between two consecutive profiles, for example, when the slope of the swimming pool floor is reversed, it is possible to remove the rims 230, for example by removing them through a cutting operation.

It is also possible, in fig. 8, and in an embodiment variant of the junction 300, to fit an inclination limiter 350 between the two sleeves 310 and 320 to increase, according to a specific value, the angle of opening L of two profiles arranged in line with each other.

The inclination device 350 will be advantageously constituted by the two sides provided with their tongue and with their groove of a profile and which are removed, for example by cutting, then assembled back-to-back, for example by gluing. The sides are assembled on the sleeves 310 and 320 by means of their tongue 212 and their groove 214. Several inclination limiters 350 can be combined to increase the value of the angle of opening L of two profiles.



In fig. 9, a protective casing realized with the sleeves 310 or 320, the side wall of which are not pierced, is mounted on the end pieces 250 closing off the connection ends of two profiles arranged laterally one against the other, to protect them.

It will be noted that at least one pair of profiles connected in the same manner can be placed between the two profiles shown in fig. 9. In this case it will be necessary to increase the length of the sleeve 310 or the sleeve 320 so that it can be fitted onto central end pieces arranged in an offset position in relation to the lateral end pieces.

In figs. 1 and 1bis, and to protect the internal walls of the swimming pool from friction caused by the movement of the floating floor 100, a protective belt 360 is realized at the periphery of the said floating floor. The protective belt 360 is constituted in fig. 10 by a flexible tube 362 assembled by gluing in a sleeve 310, 320 that is assembled on the profile 200, 200' by a tongue 212 and its corresponding groove 214 or conversely.

The floating floor is manufactured according to a plan that notably specifies the dimensions of the surface of the swimming pool to cover, the geometry of its floor. Most of the profiles constituting the floating floor are composed of profiles of a standard length. The profiles designed to be fitted at the end of a row are cut to length.

The various profiles 200, 200' are then sealed by end pieces 250, then referenced. Each profile 200, 200' fitted with its end pieces 250 is marked with a sign specifying its direction of assembly. A set of instructions accompanies the batch of the various components comprising, among others, sections of pipes pre-cut to length. The operator assembles the various rows of profiles, then places them on the surface of the water as they are completed.

Groups of rows G1-G4 are constituted by connecting a set of profile rows 200, 200' with ends of pre-cut tubes.

In figs. 11a, 11b and 11c, the inlets to the various groups are connected to the filling and draining manifold 400 and the outlets of the different groups are connected to the vent manifold 500.



The filling and draining manifold 400 is connected to the filtering unit of the swimming pool by means of a bypass line D connecting the pressure circuit of the pump P on the one hand and the suction circuit on the other. Valves V are connected to the filtering unit to act on the water circulation in the floating floor 100.

In fig. 11 a, the pressure and suction valves are open and the valves situated at the level on the bypass line D are closed, thus preventing the admission or extraction of water in the floating floor 100 which consequently remains in a stable position by being either floating or immersed at the bottom of the swimming pool.

In fig. 11 b, the water pressure circuit is blocked by the pressure valve and water is admitted by the pump P through the valve, located further along in the bypass line D and set to the open position, then circulates in the filling and draining manifold 400 which thus fills the profiles of the floating floor 100. The floor gradually sinks while retaining a constant horizontal level in the water, as shown in fig. 12a, then conforms to the geometry of the pool floor when it touches it, as shown in fig. 12b. The filling of the floating floor 100 is terminated when the water exits from the vent manifold 500.

In fig. 11 c, the pressure valve is open and the suction valve is shut. The valve further down the bypass line D is closed, whereas the valve located further up this same bypass line D is open. The pump P then empties the floating floor 100 which purges itself via the vent manifold 500. In fig. 12b, the floor thus rises gradually, then assumes a horizontal position that it maintains until it reaches the surface of the water, as shown in fig. 12a.

The different valves shown can advantageously be replaced by a multiple- way valve or by solenoid valves.

The duration of operation of the pump is set, for example, by means of a timer.

In its floating position, the floating floor of the invention enables drowning hazards to be removed.

When immersed, it enables a person in difficulty in the pool to be brought to the surface.

It reduces bacterial activity due to the action of the light.



It also reduces the loss of heat as well the power consumption of water treatment products.

Through the multiple structure of the profiles constituting it, the floating floor cannot sink in the event that the upper wall of a profile is pierced.

During its movement, and in particular at each emersion operation, it can also lift off particles adhering to the walls and floor of the swimming pool to put them into suspension so that they can be captured by the filtering system of the swimming pool.

It can be delivered in kit form, thus offering a great ease of transport.

It can be assembled without it being necessary to empty the swimming pool.

The profiles can be manufactured in different colors, thus enabling swimming lanes to be delimited on the floors of swimming pools destined for use in competition.

As an illustration, the floating floor of the invention can be used to immerse or raise objects, for example, oysters in a settling tank, a boat in a dry dock, etc.

In a second embodiment variant of the profile that is shown in fig. 13, this profile 200" comprises a plurality of internal cavities 202 arranged side by side.

A specific multiple type end piece 250' is shown in line with the profile 200". It is designed to close off each of the extremities of the profile 200". The end piece 250' is, for this purpose, provided with a plurality of connection means 270 that open out respectively into the internal cavities 202 of the multiple profile 200".

The floating floor can be raised more rapidly owing to this construction in which the multiple cavity profile 200" has a width greater than that of the profiles described above.

A protective casing realized with a sleeve 310 or a sleeve 320, whose lateral wall is pierced, is mounted on the end piece 250' closing off the connection end of the profile 200" to protect it.

In a third embodiment variant represented in fig. 14, each profile 200" is provided with a third conduit 240 arranged between the upper conduit 220 and the upper wall 204. A separating wall 242 separates the upper conduit 220 and the third conduit 240. This



conduit is designed to enable the circulation of water under the effect of solar radiation. The profile 200" must be positioned with its third conduit 240 turned upwards so that the latter can be exposed to the solar radiation. The material constituting the profile 200" will be of a dark color and preferably black or dark blue.

In fig. 17a, it will be noted that each edge of the separating wall 242 is arranged offset with respect to the end of the profile 200" according to a distance L3.

Specific end pieces 250a, 25Gb shown respectively in figs. 15 and 16 are designed to seal one or other of the ends of this profile. Each end piece 250a or 25Gb is provided with a connection means 270 adapted to be connected by means of a channel to an upper or lower conduit of the said profile and of an additional connection means 290. The flow through the additional connection means 290 is materialized in its two directions by arrows B, B' in these figs. 15 and 16.

In fig. 17b, in the cross-section of the end piece 250a visible on the right of the fig., the additional connection means 290 is connected to a channel 276 that opens out laterally on the said end piece through a discontinuity realized in the band 260 in such a manner that the said connection means 290 can be connected to the third conduit 240.

The same end piece 250a is provided with a wall delimiting one side of the channel 276 and which is prolonged by an edge 278 penetrating the third conduit 240. The water that may be introduced or removed from the third conduit 240 by circulating through the said channel 276 must therefore cross this edge 278. For this purpose see the path of the arrow E' on the edge 278 in fig. 15. The end piece 250a is the one that is designed to be connected to the vent manifold side, while the end piece 250b is the one that is designed to be connected to the suction/pressure pump side. Apart from the absence of edge 278, the other end piece 250b is identical to the end piece 250a. The end pieces 250a and 25Db are positioned by being offset by an angle of 180°.

Hence, when the third conduit 240 of the profile 200" is being filled, the admitted water enters the profile from the lower section and the expelled air leaves by the upper section, with the result that it can be almost completely filled with water before another profile connected further along can begin to be filled.



Conversely, when emptying the third conduit 240 of the profile 200", the water is evacuated through the lower part, with the result that it can be emptied almost completely of its water as soon as the other profile is emptied and that it only lets air into the said profile.

Fig. 18 shows a floating floor 100 constituted by several groups G 1-04 incorporating such profiles 200".

In figs. 18, 19a and 19b, it will be noted that there is a feed and purge manifold 600 connected between the third conduits 240 (visible only in figs. 19a and 19b) of the profiles 200" and the filtering unit. This feed and purge collector 600 is designed, during the operation of the pump P, to take water continuously from the swimming pool, on the one hand, to circulate it within the said conduits 240 in order to reheat it when the floating floor 100 is exposed to sunlight and, on the other, to force it into the swimming pool where it can mix with the water that it contains to heat the water in this manner.

Two additional valves V', seen in figs. 19a and 19b, are incorporated respectively between the manifolds 600 and 400 and the bypass line D to separately connect the water heating circuit by solar radiation and the ballast circuit of the floating floor 100.

In figs. 19a and 19b, the connecting valve V' of the manifold 600 is open while the valve V' of the manifold 400 is closed.

In fig. 19a, the other valves are positioned so that water heating circuit can be continuously fed by the pump P, whereas in fig. 19b, these valves are positioned so that the water heating circuit can be purged of any water that it contains.

In figs. 19a and 19b, another vent manifold 500' is connected to the third conduit 240 to separate the ballast circuit of the floating floor 100 from the water heating circuit.

The floating floor incorporating this embodiment variant of the profiles can, by using the covered surface of the swimming pool, capture the solar radiation to heat the water that it contains.